Worksheet §12.5

1. Let $h : \mathbb{R} - \{0\} \to \mathbb{R} - \{1\}$ be given by $h(x) = \dfrac{x+1}{x}$.

   (a) Prove that h is well-defined.

   (b) Prove that h is a bijection.

2. Let $F : \mathscr{P}(\mathbb{R}) \to \mathscr{P}(\mathbb{R})$ be given by $F(X) = X^c$. Prove that F is bijective.

3. Let $A = \{1, 2, 3\}$ and $B = \{1, 2, 3, 4\}$.

   (a) How many functions are there $A \to B$?

   (b) How many injective functions are there $A \to B$?

   (c) How many surjective functions are there $A \to B$?

   (d) How many bijective functions are there $A \to B$?